IN THE CLAIMS:

1. A method of operating a base station of a radio frequency data communication system, wherein the communication system also comprises a multiplicity of remote transceivers, said method comprising the following steps:

(a) transmitting a polling sequence to the remote transceivers;

(b) for the case where no response to the transmitted polling sequence is received from any of the remote transceivers:

(1) beginning to time a non-responsive period;

(2) transmitting a polling sequence to the remote transceivers;

(3) for the case where no response to the transmitted polling sequence is received from any of the remote transceivers,

(i) determining whether the non-responsive time period has reached a predetermined threshold period,

(ii) for the case where the non-responsive time period has reached the predetermined threshold period, entering into a dormant listening state awaiting a communication request from at least one of the remote transceivers, and branching to the step (a) above, and

(iii) for the case where the non-responsive time period has not reached the predetermined threshold period, branching to the step (b)(2) above; and

(4) for the case where at least one response to the transmitted polling sequence is received from any of the remote transceivers, servicing the responses to the transmitted polling sequence received from the remote transceivers and then branching to the step (a) above.

2. The method of claim 1 wherein the step (b)(3)(ii) further comprises servicing the communication requests received from the remote transceivers prior to branching to the step (a).

3. In a radio frequency data communication system, a method for use by a base station to optimize communication on a communication channel with a plurality of remote transceivers, said method comprising the following steps:

(1) transmitting a polling sequence, servicing each responding remote transceiver, and repeating this step if the level of activity on the communication channel is determined to be greater than a transition threshold;

(2) starting to time a period of low-activity;

(3) transmitting a polling sequence, servicing each responding remote transceiver, and repeating this step if both the level of activity on the communication channel is determined to not be greater than the transition threshold and the period of low-activity has not reached a predetermined threshold period;

(4) if the level of activity is greater than the transition threshold, resetting the timing of the period of low-activity and branching back to step (1); and

(5) if the level of activity is not greater than the transition threshold and the period of low-activity has reached the predetermined threshold period, entering a dormant state awaiting a communication request from the remote transceivers.

4. The method of claim 3 which further comprises a step (6) of responding while in the dormant state to a communication request by

servicing the requesting remote transceiver, and branching to step (5).

5. The method of claim 4 wherein the level of activity of the communication channel is determined from an average of recent loading conditions.

6. The method of claim 3 which further comprises a step (6) of responding while in the dormant state to a communication request by servicing the requesting remote transceiver, resetting the timing of the period of low-activity and branching back to re-execute step (1).

7. The method of claim 6 wherein the level of activity is not greater than the transition threshold only when no response to a transmitted polling sequence is received from any of the remote transceivers.

8. The method of claim 6 wherein the level of activity of the communication channel is determined from an average of recent loading conditions.

9. In a radio frequency data communication system, a method for use by a base station to optimize communication on a communication channel with a plurality of remote transceivers, said method comprising the following steps:

(1) transmitting a polling sequence at a polling rate, servicing each responding remote transceiver, and repeating this step if the level of activity on the communication channel is determined to be greater than a transition threshold;

(2) starting to time a period of low-activity;

(3) transmitting a polling sequence, servicing each responding remote transceiver, and if

both the level of activity on the communication channel is determined to be less than the transition threshold and the period of low-activity has not reached a predetermined threshold period, adjusting the polling rate based on the period of low-activity and repeating this step;

(4) if the level of activity is greater than the transition threshold, resetting the timing of the period of low-activity, resetting the polling rate and branching back to step (1); and

(5) if the level of activity is less than the transition threshold and the period of low-activity has reached the predetermined threshold period, entering a dormant state awaiting a communication request from the remote transceivers.

10. The method of claim 9 which further comprises a step (6) of responding while in the dormant state to a communication request by servicing the requesting remote transceiver, and branching to step (5).

11. The method of claim 10 wherein the level of activity of the communication channel is determined from an average of recent loading conditions.

12. The method of claim 9 which further comprises a step (6) of responding while in the dormant state to a communication request by servicing the requesting remote transceiver, resetting the timing of the period of low-activity and branching back to re-execute step (1).

13. The method of claim 12 wherein the level of activity is not greater than the transition threshold only when no response to a transmitted

polling sequence is received from any of the remote transceivers.

14. The method of claim 12 wherein the level of activity of the communication channel is determined from an average of recent loading conditions.

15. In a radio frequency data communication system, a method for use by a base station to optimize communication on a communication channel with a plurality of remote transceivers, said method comprising the following steps:

(1) transmitting a polling sequence at a polling rate, servicing each responding remote transceiver, and repeating this step if the average level of activity on the communication channel is determined to be greater than an average transition threshold;

(2) if the average level of activity is determined not to be greater than the average transition threshold, transitioning from an active state to a dormant state;

(3) waiting to receive communication requests, responding by servicing the requesting remote transceivers, and repeating this step if the average level of activity on the communication channel is determined to not be greater than the average transition threshold; and

(4) if the average level of activity is greater than the average transition threshold, returning to the active state by branching back to step (1).

16. The method of claim 15 wherein the average level of activity is not greater than the average transition threshold only when no response to a transmitted polling sequence is received from any of

the remote transceivers during a predetermined threshold period.

17. The method of claim 15 wherein the average level of activity of the communication channel is determined from an average of recent loading conditions during a predetermined threshold period.

18. A radio frequency data communication system for transmission of data collected by a multiplicity of mobile transceiver units to one or more base transceivers, comprising:

the base transceivers selectively operable at least one data rate,

the multiplicity of mobile transceiver units selectively communicative with said one or more base transceivers, each of said mobile transceivers selectively operable in response to transmission from one of said base transceivers,

each of said mobile transceiver units independently cycling from a dormant status to an active status over predetermined time intervals and returning to the dormant status when no transmission from the base station is directed to such mobile transceiver unit.

19. The radio frequency data communication system of Claim 18 wherein a contention poll is sent by a base transceiver to a multiplicity of mobile transceiver units, wherein the mobile transceiver unit enters a dormant state during which the mobile transceiver unit is not in communication with the base transceiver after a fixed period during which the mobile transceiver unit is in an active state, and wherein the mobile transceiver unit re-enters the active state for a brief interval and returns to the dormant state if it receives no message.

20. A radio frequency data communication system for transmission of data collected by a multiplicity of mobile transceiver units to a base station, comprising:

the multiplicity of mobile transceiver units selectively communicative with the base station, each of said mobile transceiver units selectively operable in response to transmission from the base station,

each of said mobile transceiver units independently cycling from a dormant status to an active status over predetermined time intervals and returning to the dormant status when no transmission from the base station is directed to such mobile transceiver unit.

21. The radio frequency data communication system of Claim 20 wherein a contention poll is sent by the base station to a multiplicity of mobile transceiver units, wherein the mobile transceiver unit enters a dormant state during which the mobile transceiver unit is not in communication with the base station after a fixed period during which the mobile transceiver unit is active, and wherein the mobile transceiver unit re-enters an active state for a brief interval and returns to the dormant state if it receives no message.

22. A radio frequency data communication system for transmission of data collected by a multiplicity of mobile transceiver units to a base station, comprising:

the multiplicity of mobile transceiver units selectively communicative with the base station at a first data rate, each of said mobile transceiver units selectively operable in response to transmission from the base station,

each of said mobile transceiver units independently cycling from a dormant status to an active status over predetermined time intervals and returning to the dormant status when no transmission from the base station is directed to such mobile transceiver unit,

the base station operable at a first system clock rate during transmission or reception to minimize the generation of digital noise and at a second system clock rate that is higher than the first for data processing at the second rate.

23. The radio frequency data communication system of Claim 22 wherein a contention poll is sent by the base station to a multiplicity of mobile transceiver units, wherein each of the mobile transceiver units enters a dormant state during which each of the mobile transceiver units is not in communication with the base station after a fixed period during which the mobile transceiver unit is in an active state, and wherein the mobile transceiver unit re-enters the active state for a brief interval and returns to the dormant state if it receives no message.

24. The radio frequency data communication system of Claim 23 wherein the terminal is operated normally at a slow system clock rate to minimize generation of digital noise, and is switched to a fast clock rate during barcode scanning to allow data obtained from the barcode scan to be processed at a higher rate.

25. The system of Claim 24 wherein the terminal is operated normally at a slow system clock rate to minimize generation of digital noise, and is switched to a fast clock rate during barcode

scanning to allow data obtained from the barcode scan to be processed at a higher rate.

26. A radio frequency data communication system for transmission of data collected by a multiplicity of mobile transceiver units, to a base transceiver, comprising:

a base transceiver selectively operable at a limited data rate and at an increased data rate;

the multiplicity of mobile transceiver units selectively operable at the limited data rate and at the increased data rate;

said mobile transceiver units responsive to transmissions by said base transceiver, and having control means therein to evaluate the feasibility of responding at said increased data rate;

said base transceiver effecting a communication link with one or more of said mobile transceiver units;

said mobile transceiver units for which a communication link with said base transceiver has not been established receiving the transmissions of said base transceiver to said mobile transceiver units with which a communication link has been established;

said mobile transceiver units evaluating for consistent reception of said transmissions to said one or more transceiver units;

said mobile units which consistently receive transmissions at the increased data rate responding to the base transceiver at said increased data rate when said base transceiver directs communication to said mobile unit.

27. The system of claim 26 wherein said mobile transceiver units independently evaluate transmissions from the base transceiver to said one

or more mobile transceiver units having a communications link with said base transceiver.

28. The system of claim 26 wherein each mobile transceiver unit remains to receive data while no communication link is established between said mobile transceiver unit and the base transceiver.

29. The system of claim 26 wherein the base transceiver transmits packets of data to said one or more mobile transceiver units having a communication link with the base transceiver, each mobile transceiver unit with which a communication link has not been established,

attempting to receive packets of data transmitted by the base transceiver to said one or more units having a communication link with the base transceiver;

each mobile transceiver unit with which a communication link has not been established;

evaluating receipt of packets of data at the increased data rate and at the limited data rate.

30. The system of claim 26 wherein said mobile transceiver units which have not established a communication link with said base receiver receiving polling signals transmitted by said base transceiver at the increased data rate,

said mobile transceiver units evaluating for constant reception of said polling signals, to determine the feasibility of successful communication with said base transceiver at the increased data rate.

31. The system of claim 26 wherein said mobile transceiver sampling data transmitted to said one or more of said mobile transceiver units

at said limited data rate and at said increased data rate. The system of claim 26 wherein said limited data rate is 4800 baud and said increased data rate is 9600 baud.

32. In a radio frequency data communication system wherein a multiplicity of mobile transceiver units are to collect data and are to transmit the collected data promptly after its collection to a base transceiver station and wherein reliable communication between such mobile transceiver units and said base transceiver station could occur at a limited data rate, the invention comprising:

a base transceiver station capable of transmitting data at a limited data rate and at an increased data rate, said base transceiver station effecting a communication with at least one of the mobile transceiver units at the increased data rate;

the mobile transceiver units evaluating the communication from the base transceiver station to said at least one mobile transceiver unit to predict whether successful communication with the base transceiver station will occur at the increased data rate;

said mobile transceiver units which predict successful communication with the base transceiver station at the increased data rate responding to signals from the base transceiver station at the increased data rate;

said mobile transceiver units which fail to predict successful communication with the base transceiver station at the increased rate responding signals from the base transmission station at the limited data rate.

33. The system of claim 32 wherein said mobile transceiver units responding at the

increased data rate transmitting their identities to said base transceiver station and said mobile transceiver units responding at the limited data rate transmitting their identities to said base transceiver station.

34. The method of operating a radio frequency data communication system wherein a multiplicity of mobile transceiver units are to collect data and are to be able to transmit the collected data promptly after its collection to a base transceiver station, during movement of the mobile transceiver units at varying distances from the base transceiver station and wherein reliable communication with such mobile transceiver units over the entire area of mobile operation could only take place at a limited normal data rate, said method comprising:

in a communications interchange between the base transceiver station and one or more mobile transceiver units, effecting an RF wireless transmission from said base transceiver station in one communication direction via an RF link at a higher than normal data rate;

at a mobile transceiver unit receiving the transmission, evaluating the consistency of reception of the transmission at a higher than normal data rate to predict successful communication between a respective mobile transceiver unit and the base transceiver station at a higher than normal data rate in spite of potentially adverse transmission conditions;

if the evaluation of the received transmission determines that transmission at a high data rate would be likely to be subject to detrimental transmission conditions, transmitting a responsive RF wireless transmission in the opposite communication direction via said RF link signalling

for further communications interchange at the limited normal data rate, and

if the evaluation of the received test signal determines that transmission conditions are not likely to prevent successful transmission at a high data rate, transmitting a responsive RF wireless transmission in such opposite communication direction via said RF link signalling for further communications interchange at a higher data rate substantially higher than the limited normal data rate.

35. In a data communication system having a plurality of mobile transceiver units communicative with a plurality of base transceiver units,

a network controller intercommunicative between the base transceiver units and one or more host computers for data interchange therebetween.

36. In a data communication system having a plurality of mobile transceiver units selectively communicative with a plurality of base transceiver units,

a network controller intercommunicative between the base transceiver units and one or more host computers for data interchange therebetween,

an adapter coupled to the network controller and intercommunicative between said controller and said plurality of base transceiver units,

said adapter providing coupling between said network controller and said base transceiver units simultaneously.